Short Note for
Quick Revision

Swasthavritta

Paper – II

Volume-1

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Part-A

जनपदोद्ध्वंस

जनपद + उद्ध्वंस = जनपदोद्ध्वंस

(The disease which produces destruction of large population)

Cause:

दूषित वायु – दूषित जल – दूषित देश – दूषित काल

Root cause for vitiation of vayu etc is अधर्म or misdeeds of past performed by intellectual errors (प्रज्ञापराध). Sinful acts may be in form of wars, demons, germs & curse.

Management:

- Avoid sinful acts & प्रज्ञापराध.
- रसायन विधि : Rejuvenation to enhance immunity.
- पूर्व उद्धृत औषध प्रयोग : Physician should use previously collected drugs to treat people.
- सत्य – दया – दान – बलि – देवता अर्चना - ब्रह्मचर्य – सद्वृत्त.
- Immigration to हितकर जनपद.

वायु(Air)

गुण (Qualities):

पूर्वी वायु : Eastern winds are मधुर – स्निग्ध – लवण – गुरु- विदाही- रक्तपित्त वर्धक – कफकर – सर्वरोग वर्धक – it is unwholesome for the patient suffering from क्षत (injury)

दक्षिणी वायु : Southern winds are मधुर – कषाय – लघु - अविदाही – रक्तपित्तहर – चक्षुष्य – बलवर्ध – not aggravates वात

पश्चिमी वायु : western winds are विशद – रुक्ष – परुष –खर – it reduces स्नेह, बल & ओज – causes सद्य:प्राणक्षय

उत्तरी वायु : Northern winds are स्निग्ध – मृदु –मधुर – कषाय-शीत – it does not vitiate दोष – enhances क्लेद & बला वर्धक – good for patients of क्षय & विष

Normal Functions of वायु : धरणी धारणं – ज्वलनोज्ज्वालनं – सूर्यचन्द्रनक्षत्रग्रहगणानां गति – मेघानां सृष्टि – स्रोतसां प्रवर्तनं – फलपुष्पानां अभिवर्तनं - ऋतुनां विभाग: - धातूनां विभाग: - रुक्षण – शोषण etc.
(in short- movement, development, division, dryness etc.)

दूषित वायु : Vitiated or poisonous air which is polluted with smoke and poison makes the birds tired & they fall over the earth. It also produces diseases like कास, प्रतिश्याय, शिरोरुज, नेत्ररोग etc.

वायु शोधन (Purification):

धूपन (fumigation) or **हवन** (यज्ञ) with dravyas like कर्पूर – चंदन – निम्ब – गुग्गुलु - अगरु –देवदारु – सर्जा – गंधक – लाक्षा – हरिद्रा etc.

Air of occupied room (indoor air):

Human occupancy brings about changes in surrounding air with two aspects:

1. Physical changes
   Such as increase of temperature, increase of humidity, reduced air movement, body odour, contamination etc.
2. Chemical changes
   Such as increase of CO_2 concentration & decrease of O_2 conc.

Measurement of thermal comfort:

Air temperature

Air temperature & humidity

Cooling power

Effective temperature (ET)

Corrected effective temperature (CET)

McArdle's maximum allowable sweat rate

Comfort zone:

Feeling	CET (°C)
1. Pleasant and cool	20°C
2. Cool and comfortable	20 - 25°C
3. Comfortable	25 - 27°C
4. Hot and comfortable	27 - 28°C
5. Extremely hot	28°C
6. Intolerably hot	30°C

Feeling	Predicted 4 hours sweat rate (P_4SR)
1. Comfort zone	1 – 3 liters
2. Just tolerable	3 – 4.5 liters
3. Intolerable	4.5 liters

Composition of Air

Nitrogen	78.09%
Oxygen	20.95&
Carbon dioxide	0.04%
Argon etc.	traces
Water vapours	
Suspended particles	

Air Pollution

Sources of air pollution:

1. Combustion of fuels (industries & automobiles)
2. Respiration of living beings (CO_2)
3. Decomposition of organic materials
4. Miscellaneous (incinerators, nuclear setups etc.)

Air pollutants:

1. Gaseous: SO_2, NO_2, CO_2, CO, hydrocarbons etc.
2. Particulates: Dust, Fumes, Smoke, Mist, Spray

Effects of air pollution:

1. Health aspect, e.g. RTIs, COPDs, asthma, cough, lung cancer, air-borne diseases etc.
2. Social aspect, e.g. destruction of plants & animals etc.
3. Economical aspect, e.g. corrosion of metals etc.

Prevention & Control of air pollution:

- PUC for automobiles
- Rules & legislation for factories
- Support government policies
- Use of eco-friendly products & Recycling
- Plantation

Ventilation:

Ventilation is defined as the science of maintaining atmospheric condition in the buildings, which are comfortable and healthy for human body.

Types: Natural & Artificial ventilation

1. Natural ventilation
    a. Wind
    b. Diffusion
    c. Variation of temperature
2. Artificial ventilation
    a. Exhaust
    b. Plenum
    c. Combined/ Balanced
    d. Air condition (AC)

High altitude / Mountain air:

The atmospheric pressure and pO_2 (partial pressure of oxygen) decreases at high altitude.

This can lead to acute mountain sickness due to less O_2,

It can also lead to fata medical problems like high-altitude pulmonary edema (HAPE) & high-altitude cerebral edema (HACE).

जल (Water)

जल भेद: दिव्य(अंतरीक्ष) & भौम जल
अन्तरीक्ष जल : धार-कार-तैषार-हैमवति
भौम जल : कौप-सारस-नादेय-तडाग
(Pure water: गंगाम्बु, Impure water: सामुद्राम्बु)

Qualities of water:
निर्गन्धं – अव्यक्तरसं – शुचिं – शीतलं – लघु – हृद्य – तृष्णाघ्न

Importance of water:
Around 70% of human body contains water. (infants=75%, adults=60-65%) – it forms body fluids like Blood, Lymph, CSF, Saliva, Urine, Semen etc.
It is universal solvent – inexpensively available in large quantity – non toxic – soothing – it promptly absorbs and holds heat etc.

दूषित जल : Polluted water has 6 dosha : स्पर्शदोष-रुपदोष-रसदोष-गंधदोष-वीर्यदोष-विपाकदोष

Water Pollution

Sources of water pollution:
Sewage, Industrial & trade wastes, Agricultural wastes, Physical Chemical & Biological pollutants

Impurities of water:
1. Dissolved impurities: Gases & Minerals
2. Suspended impurities: Dirt, Bacteria, Parasites etc.

Water borne diseases:
Diarrhea – Dysentery – Amoebiasis – Cholera - Worm infestations – Typhoid – Gastroenteritis - Hepatitis etc.

Purification of water

1. Small scale purification
2. Large scale purification

Small scale purification of water:
1. Boiling
2. Filtration
3. Chemical disinfection
    a. Chlorine
    b. Iodine
    c. Bleaching powder

Large scale purification of water:

1. Storage
    a. Physical
    b. Chemical
    c. Biological
2. Filtration
    a. Slow sand filtration
    b. Rapid sand filtration
3. Disinfection
    a. Chlorination
    b. Ozonation
    c. Ultraviolet radiation

Slow sand filtration:

Components of Slow sand filtration

I. Supernatant raw water
II. Bed of sand
III. Under drainage system
IV. Filter control valves

Rapid sand filtration:

Components of Rapid sand filtration

I. Coagulation chamber
II. Rapid mixing chamber
III. Flocculation chamber
IV. Sedimentation chamber
V. Filtration unit

Hardness of water

Definition: Soap destroying power of the water is known as hardness of water.

Types: 2 types

1. Carbonate: temporary hardness
2. Non-carbonate: permanent hardness

Classification of water on the basis of hardness:

1. Soft water
2. Moderately hard water
3. Hard water
4. Very hard water

Treatment of hardness of water:

Boiling – Addition of Lime – Addition of Sodium bicarbonate

भूमि & निवास स्थान (Land)

Types of soil:

1. Sandy soil
2. Silty soil
3. Clay soil
4. Loamy soil
5. Peaty soil
6. Chalky soil

Land pollution: The deposition of solid or liquid waste materials on land or underground in a manner that can contaminate the soil and groundwater, threaten public health.

भूमि शोधन (Purification of land) :

मार्जन (cleaning or sweeping) – दाह (burning) – गोक्रमण (grazing of cows) – सेक (sprinkling of water) – उल्लेखन (scrapping) – लेपन (covering land or painting)

निवास योग्य भूमि : Square, elevated & in south-west direction. Smell of horse, elephant, bamboo, *Nagakeshara, Jatipushpa, Dhanya* in the land is good.

Plane land with good smell, which is fertile, dark coloured unctuous & soft to touch, is good for construction of houses.

Housing:

Housing includes both physical structure providing shelter, surrounding community services & facilities.

Purpose of housing:

- Provides sanitary shelter & protection
- Provides space for family life
- Provides easy access to community facilities

Housing standards in India:

Site selection – Set back – Flooring – Thickness of Walls – Height of Roof – Number of rooms – Floor area – Space – Windows – Lighting – Kitchen – Latrine – Bathroom - Disposal of garbage and refuse – Sanitary water supply

महानस (Kitchen): should be in south-east direction – latrines & bathrooms should not be near kitchen - holes in the roof of kitchen to escape of smoke etc.

Standards for overcrowding:

1 room	2 person
2 room	3 person
3 room	5 person
4 room	7 person
5 room	10 person

प्रकाश(Lighting)

Factors affecting good lighting:

Quantity – Distribution – Brightness – Shadows – Flickering – Nature of light – Background

Natural lighting:

Daylighting is the practice of placing windows or other openings and reflective surfaces so that during the day natural light (sunlight) provides effective internal lighting.

Artificial lighting:

1. Filament lamps (Bulbs)
2. Fluorescent lamps (Tube lights)
3. LED lights

Effects of lighting:

Vision depends on lighting.
Light can be motiving, relaxing or calming, and
Improper or insufficient light can be irritating.
Light is also used as medical treatment.

ध्वनि प्रदूषण (Noise pollution)

- Noise is the undesirable sound, causing trouble or annoyance to the listener.
- Safe limit of noise – 90 dB

Sources of noise pollution:

Automobiles – Industries – Air crafts – Domestic appliances – Entertainment appliances etc.

Effect of noise on health:

- Loss of hearing
- Annoyance / Irritation
- Insomnia
- Fatigue
- Altered cognition and psychomotor functions

Prevention & Control:

Rules & Legislation – Personal protection – Soundproofing – Efficient machinery etc.

विकिरण(Radiation)

Radiation is a form of energy, released from a particular material, in all directions, in the form of waves, each wave carrying a quantum of energy or released in the form of fast moving sub-atomic particles.

Source:

1. Natural source
    a. Cosmic rays
    b. Environmental
    c. Internal
2. Artificial sources
    a. Radiological techniques (in medicine)
    b. Nuclear reactors and explosions
    c. Daily appliances (TV, mobiles etc.)

Effects of radiation:

Acute effects

- Radiation sickness
- Acute radiation syndrome

Chronic effects

- Leukemia
- Malignancies (Cancer)
- Genetic mutations etc.

Control and prevention:

Legislation – Judicious use of radiological techniques in medical science – Shielding – Maintenance of safe distance

अपद्रव्य निर्मूलन (Disposal of solid waste)

Solid wastes: Solid wastes are defined as the wastes (refuse) from street market, stable, industries & houses excluding sullage and night oil.

These are useless, unwanted, or discarded materials in solid form.

Types of solid wastes:

Garbage (food wastes)

Rubbish (paper, plastic, wood, metals etc.)

Demolition products (brick, masonry etc.)

Sewage treatment residue (sludge & solids from sewage)

Storage & Collection of refuse:

1. Storage of refuse:
   Storage at the generation and pick-up points.
2. Collection of refuse:
   Pick-up by crew (sweepers), trucks -
   house to house, or from public-bins

Disposal methods of solid wastes:

1. Dumping (Waste is dumped in open ditches)
2. Controlled pitting (disposed in trench & covered with mud)
3. Incineration/ Burning (disposed hygienically by burning)
4. Composting (Waste is decomposed & recycled as a fertilizer)
5. Manure pits (dumped in pits & covered everyday – for rural)
6. Burial (small amount of waste is buried – for small camp)

Bio-medical wastes:

Bio-medical wastes are generated during the diagnosis, treatment or immunization of human beings or animals or in research activities.

Hazards of bio-medical wastes:

Infection – Cytotoxicity – Genotoxicity – Chemical toxicity – Physical injuries – Radioactivity hazards etc.

Management of bio-medical wastes:

- Incineration / burning
- Chemical disinfection
- Wet and dry thermal treatment
- Microwave irradiation etc.

मलनिष्कासन व्यवस्था (Disposal of excreta)

Methods of excreta disposal:

1. **For unsewered area:**

1. Service type (conservancy system)
2. Non-service type (sanitary latrines)
    a. **Permanent toilets →**
    i. Bore hole latrine
    ii. Dug well or pit latrine
    iii. Water seal latrine
        a. PRAI type
        b. RCA type
    iv. Septic tank
    v. Sulabh shauchalaya
    vi. Aqua privy
    vii. Chemical closet

    b. **Temporary toilets →**
    i. Shallow trench latrines
    ii. Deep trench latrines
    iii. Pit latrines

2. **For sewered area:**
    a. **Primary treatment:**
    i. Screening
    ii. Grit chamber
    iii. Plain sedimentation
    b. **Secondary treatment:**
    i. Trickling filters method (TFM) or percolating filter
    ii. Activated sludge process
    c. **Other methods:**
    i. Sea out method
    ii. River out method
    iii. Sewage farming
    iv. Oxidation ponds etc.

Disposal of dead body

Method of disposing dead body:

1. Burning / cremation:
   i. Traditional method
   ii. Electric cremation

2. Burial

Meteorology (ऋतु एवम् वातावरण ज्ञान)

Weather: the state of the atmosphere with respect to heat or cold, cloudiness, dryness, sunshine, wind, rain etc.

Climate: the weather pattern or condition in an area over a long period.

Factors influencing weather & climate:

- Temperature (How hot or cold atmosphere is)
- Humidity (amount of water vapour in the atmosphere)
- Atmospheric pressure (air pressure)
- Wind (movement of air)
- Rainfall etc.

Disaster management

Disaster: hazard resulting in an event causing significant physical damage, destruction or death.

"A disaster is defined as any occurrence that causes destruction, ecological disturbance, loss of human life or worsening of health and health services on a measure adequate to warrant an extraordinary reaction from outside the affected community or area".

Natural disasters:

Earthquakes – Landslides – Volcano eruptions – Floods – Hurricanes – Tornadoes – Cyclones – Tsunami etc.

Man-made disasters:

Warfare - Road traffic accidents – Stampedes – fires – industrial accidents – Nuclear explosions/ radiation etc.

Epidemiologic surveillance and disease control:

Surveillance is an essential part of communicable disease control and prevention, which includes the following components:

Monitoring disease trends – Monitoring the progress of disease control objectives – Estimating the size of a health problem – Detecting outbreaks of infectious disease – Identifying research needs etc.

Occupational Health

Occupational Health is an important branch of preventive medicine. It deals with:

i. Promotion and protection of the health of the worker,
ii. Early diagnosis and prompt treatment of occupational diseases and
iii. Rehabilitation in case of disablement

Occupational Hazards: An occupational health hazard is a hazard experienced in the workplace.

- **Physical hazards** such as extremes of temperature and humidity, abnormal air pressure, vibrations, noise, radiant energy.
- **Chemical hazards** such as dust, toxic substances, and poisoning.
- **Biological hazards** such as tetanus, anthrax, leptospirosis, fungal infections, and scabies etc.
- **Mechanical hazards** such as accidents or injuries from machinery parts
- **Social or Psychological** related to work environment such as tension and worry related to coworkers and employers, job security and the conditions of employment.

Occupational Diseases:

Diseases	Causative factors	Clinical features	Prevention & management
Lead poisoning	Lead arsenate, lead oxide, lead carbonate etc. used in batteries, glass, ship building, printing, pottery etc.	Inorganic lead-abdominal colic, constipation, blue line on gums, anemia, wrist drop & foot drop. Organic lead-Insomnia, headache, mental confusion, delirium etc.	Substitution, isolation, ventilation, periodic Check-ups, saline purge & pencil-amine.
Mercury poisoning	Dental medicine, batteries ceramics, electroplating.	Stomatitis, foetid death, sponginess of gums, falling of teeth, anemia, muscular tremors, paralysis.	Ventilation, enclosure, personal protection.
Arsenic poisoning	Manufacture of semiconductor, fossil fuel, burning, wood preservatives, herbicides, match stick.	Painful eruptions on mucous membrane, conjunctivitis, edema of eyelids, vomiting, and colic with marked diarrhea, anemia, local irritation around mouth, nose & armpit.	Removal from site is necessary, gastric lavage within 24 hours of ingestion and symptomatic treatment.
Silicosis	Dust containing free silica from mining of coal, mica, gold, silver, lead etc. pottery ceramic industry, sand blasting, building work, iron & steel.	In early stage irritant cough, dyspnea on exertion & chest pain. Advanced stages impairment of total lung capacity. X-ray shows ‘snow-storms’ appearance of lung field.	Control of dust by substitution enclosure, isolation, hydro blasting, Personal protection, regular health checkups

Diseases	Causative factors	Clinical features	Prevention & management
Asbestosis	Asbestos is a compound made of silica with magnesium, iron, calcium, sodium & aluminum, used in cement, roof tiling, fire proof textile	Fibrosis due to mechanical irritation. X-ray shows ground glass appearance in lower 2/3rd of lung field. Disease is progressive.	Control of dust by substitution enclosure, hydro blasting, Personal protection, regular health checkups.
Anthracosis	Coal mines.	Simple pneumoconiosis, Exposure of about 12 years leads to little ventilatiory impairment, progressive massive fibrosis, severe respiratory disability, often results in death.	Control of dust by substitution enclosure, hydro blasting, Personal protection, regular health checkups.
Bagassosis	Inhalation of bagasse or sugarcane dust in sugar industries or paper making, thermactinomyces sacchai' causes it.	Breathlessness, cough, hemoptysis, slight fever, acute bronchiolitis, skiagram shows molting in lungs or shadows. Impairment of pulmonary function.	Wet process, exhaust ventilation, protective masks, and regular health checkups.
Farmer's Lung	Mouldy hay or grain dust inhalation, Thermophylic actinomyces, sand blasting, building work, iron & steel.	Acute illness characterized by general respiratory symptoms, fever, chills, cough, and dyspnea without wheezing. In chronic form repeated attacks causes patchy fibrosis of lungs.	Personal protection, Symptomatic treatment

Prevention of Occupational Diseases:

1. Health Promotion
2. Specific Protection
    i. Medical Measures
    ii. Engineering Measures
3. Early diagnosis and treatment
4. Disability limitation
5. Rehabilitation

ESI Act: (The employee's state insurance act, 1948)

- It provides both medical & sickness benefits along with maternal benefit, disablement benefit, rehabilitation allowance & funeral charges.
- It includes facilities like OPD services, drug supply, immunization etc.
- Sickness benefit in the form of cash payment for 91 days or even more in sickness conditions like TB, Leprosy, AIDS etc.
- Maternity benefit in the form of cash in case of pregnancy & abortion is provided.
- In case of injury or disability payment is given periodically.
- In case of death funeral expenses are borne by the agency.

- All benefits are delivered thereof ESIs hospitals, clinics and approved independent medical practitioners.
- Wage limit for coverage under the Employees State Insurance Act, 1948 has been enhanced from Rs.1000 to Rs.15000 per month with effect from 1 May 2010.

The Factory Act, 1948

(1) Scope-
10 or more workers are working in a place, where power used is called as factory.
20 or more workers are working in a place, where no power is used is called factory.

(2) Health, safety & welfare-
Here cleanliness, lighting, ventilation are considered.

Safety officer is appointed every 1000 or more workers.
Canteen should be present where 250 workers are working.
One welfare officer for 500 or more workers is essential.

(3) Children below 14 yrs are prohibited.

(4) Work hours-
Man - 48 hrs/week
Man - 9 hrs/day
Rest of ½ hrs after 5 hrs work

(5) Leave with wages-
Adult · one day for 20 days of week, 30 days (maximum)
Children · one day for 15 days of work, 40 days (maximum)

(6) Occupational disease should be notified.

(7) Employment hazard should be considered.

Offensive Trades:

- Keeping of animals
- Slaughtering of animals
- Blood boiling or drying
- Bone boiling or crushing
- Gut scraping etc.

Dangerous & offensive trades require licensing.

School Health

School health services contribute to the goals of the education system and the healthcare system by providing screenings and referrals, administering medications and treatments, providing first aid, providing health counseling and education, and supporting students to acquire self-management skills.

Health problems of school children:

- Malnutrition
- Infections
- Worm infestations
- Skin diseases
- Eye disease
- Diseases of ENT
- Dental health & hygiene

Components of School health programme:

- Health promotion by education
- Mid-day meal
- Environmental sanitation
- Periodic health check-ups
- Oral health services
- Mass deworming
- School immunizations

School immunization programme:

- DPT at school entry to children aged 5 years
- TT at 10 years of age
- TT at 16 years of age
- Japanese encephalitis vaccine (in selected area)

Epidemiology

Concept of Epidemiology: the branch of medicine which deals with study and analysis of the pattern, cause, and effects of health and disease conditions in defined population.

Epidemic:

'Epi' means *upon*, and *'demons'* means *people*.

The unusual occurrence of a disease or other health related events in a community or region at a particular time.

Endemic:

'En' means *in*, and *'demons'* means *people*.

Constant presence of a disease or infectious agent among particular people or in a certain area.

Pandemic:

An epidemic affecting a large population, a part of nation or continent.

Dynamics of disease transmission

1.Source or Reservoir of infection

A reservoir is any individual, animal, object or material in which an infectious agent multiplies or develops and upon which it depends as a species its survival in nature.

Sources: Human Cases & Carriers – Animals & Birds – Non living things etc.

2.Modes of transmission

i. Direct transmission

a. Direct contact
b. Droplet
c. Contact with soil
d. Inoculation
e. Transplacental

ii. Indirect transmission

(The spread mainly takes place by 5 Fs, Flies, Fingers, Fomite, Food & Fluid.)

a. Vehicle borne
b. Vector borne
c. Air borne
d. Fomite borne
e. Unwashed hands

3.Susceptible Host

Host is a person or other animal that gives shelter or place to an infectious agent under natural conditions.

Disease

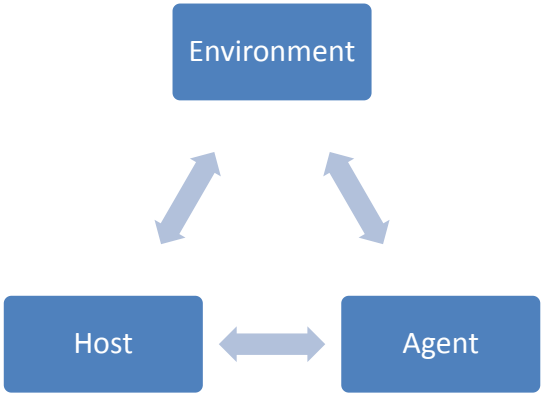
(Disease literally means 'without ease' i.e. uneasiness.)

Disease is the state of the body or some part or organs of the body in which its functions are interrupted or disturbed.

Infection

The entry and development or multiplication of an infectious agent in the body of man or animals is infection.

Epidemiological triad



Natural history of disease:

1. Pre-pathogenic phase
2. Pathogenic phase

Concept of control:

2 Steps:

Disease control – Disease eradication

Concept of prevention:

3 Levels of prevention:

I. Primary prevention → during pre disease

II. Secondary prevention → during latent disease

III. Tertiary prevention → during symptomatic disease

Modes of intervention:

1. Health promotion
2. Specific protection
3. Early diagnosis and treatment
4. Disability limitation
5. Rehabilitation

Incidence and Prevalence:

Incidence is the manifestation of new cases of particular ailment in an area during a definite period of time.

Prevalence includes both new and old cases during the definite period.

Disease prevention and control

Links require to break for prevention and control of disease:

1. Reservoir (source of infection)
2. Modes of transmission
3. Susceptible host

Steps required to control the reservoir:

1. Early diagnosis
2. Notification
3. Epidemiological investigations
4. Isolation
5. Quarantine
6. Treatment

Steps required to prevent the susceptible host:

1. Immunization
    a. Active
    b. Passive
    c. Combined
2. Chemoprophylaxis
    a. Causal
    b. Clinical
3. Non-specific measures
    a. Sanitation
    b. Nutrition
    c. Education etc.

Isolation: defined as separation for the period of communicability of infected persons or animals from others in such places & under such conditions as to prevent or limit the direct & indirect transmission of infectious agent from those infected to those who are susceptible or who may spread the agents to others.

Quarantine: defined as the limitation or restriction of movement of such healthy persons or domestic animals exposed to communicable disease for a period of time, not longer than longest incubation period of the disease in such manner as to prevent effective contact with those who are not exposed.

Investigation of epidemic:

1. Determine the existence of an outbreak
2. Confirm the diagnosis
3. Define a case
4. Search for cases
5. Generate hypothesis using descriptive findings
6. Test hypothesis with an analytical study
7. Draw conclusions
8. Communicate findings (Notification)
9. Execute prevention measures